Infrastructure cost and availability issues for broad-scale upzoning

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Abstract

Broad-scale upzonings have been promoted as a major means of increasing housing supply and improving housing affordability. However, such upzonings also tend to reduce the usefulness of zoning as a tool for managing the cost and availability of supporting infrastructure. A key consideration for decision-making in relation to broad-scale upzonings is therefore the extent to which the expected benefits of increased housing supply warrant the community costs of poorer management of the cost/availability of required infrastructure.

Equilibrium market absorption rates, or the rate at which developers can feasibly supply a market over time, are the key determinant of the rate of new private market housing supply. It is hypothesised that applies unless the planning system creates overarching binding constraints or limits on supply, below what would otherwise be the market absorption rates. Accepting that, to the extent upzoning changes exceed what is required to effectively avoid such binding constraints, there would be no significant additional benefit to housing supply. Any additional community costs of poorer infrastructure cost/availability management associated with the upzoning would therefore outweigh that benefit.

Auckland has undertaken major upzonings in two main phases, first with the Auckland Unitary Plan adopted in 2016 and now with the proposed Plan Change 78 notified in 2022, the latter being required by national government policies. Following the close to quadrupling of dwelling potential in 2016, the proposed Plan Change 78 more than doubles that again, to over 2.1 million additional dwellings, more than 10 times projected growth over the next 30 years. This would appear far in excess of what is required to avoid a binding constraint on supply. Much of the increase in dwelling potential is dispersed across the existing urban area, with over 70 per cent of urban residential sites having the potential for three dwellings without consent. Only limited parts of the city have been specifically identified as subject to existing infrastructure constraints where planning approval is required for intensification.

Partly implemented Sydney upzoning changes are substantial, but more moderate and selective than those in Auckland. The Transport Oriented Development Program, with suggested total yields of about 230,000 dwellings over 15 years, includes eight larger accelerated precincts and 37 Tier 2 400-metre catchments of transport hubs and town centres. Those sites were selected from 305 train and metro station locations to identify areas that have enabling infrastructure capacity. Since July 2024, the associated 'Low and mid-rise housing' changes, suggested as delivering 112,000 more homes over five years, include enabling development of dual occupancies across most of the Low density residential zone, which covers about 77 per cent of residential areas. From later in 2024, such changes are also proposed to expand the permissibility and densities of low and mid-rise housing types within 800-metre catchments of particular town centres and stations.

In both Auckland and Sydney, the upzoning changes have focused on infill and redevelopment. The generally smaller, more incremental nature of infill and redevelopment projects makes the identification of a preferred sequence of development, a suggested tool for managing infrastructure costs/availability for broad areas of greenfield growth, less practical. The relative absence of zoning itself as a tool for such infrastructure cost/availability management is expected to lead to greater planning and funding uncertainty and the potential for greater costs or delays in the provision of necessary infrastructure upgrades. Over time, such consequences are likely to be more significant in Auckland.

Introduction

Major upzonings of land, to significantly increase dwelling potential provided for by statutory planning instruments, have been promoted as one means of increasing housing supply and improving housing affordability (e.g. Coates and Moloney 2023). The previous insight, The Auckland upzoning impact: Dwelling type and tax matters (see at https://www.landsupplyinsight.com.au/insights) considered the role of townhouses and tax in contributing to increased dwelling development since the 2016 upzoning in that city.

This paper outlines infrastructure cost and availability issues associated with broad-scale upzonings to further inform consideration of the costs and benefits of such land use planning decisions. While touching on issues for and differences between infill and greenfield development, the focus is on upzoning in existing urban areas.

The paper considers the following, in order:

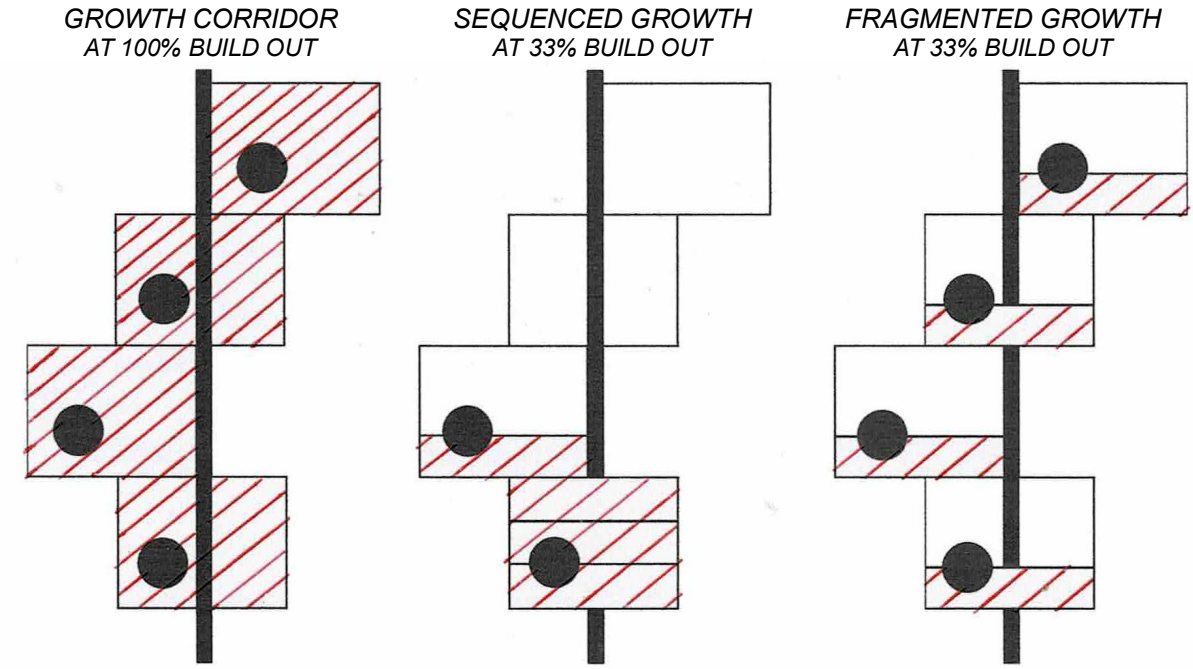
- the issues in principle and the findings of previous research into infrastructure costs incurred to support intensification of development in existing urban areas;
- how infrastructure cost and availability issues have been addressed in connection with the Auckland Unitary Plan;
- how such issues have been considered in the major planning changes currently being implemented in Sydney; and
- discussion, conclusions and implications of this analysis for broad-scale upzonings.

Infrastructure implications of the extent of zoned land

A key issue with the extent of urban zoned land may be the sheer scale of the dwelling potential provided for in comparison to the expected rate of dwelling growth. The consequent extended time and spatial area over which the planned potential might be taken up has implications for the cost and/or availability of the infrastructure required to support such growth.

This issue has been noted by Spiller and Forrest (2017), with their focus being on fragmented greenfield growth occurring simultaneously across multiple development fronts within one growth corridor. Figure 1 illustrates the basic concept in comparing sequenced to fragmented growth (Spiller and Forrest 2017).

Figure 1: Sequenced versus fragmented growth



The left side of Figure 1 shows the infrastructure required, represented by the black dots, e.g. schools, at 100 per cent build-out of a growth corridor. The right part of the figure shows that provision of all such infrastructure is potentially triggered at 33 per cent of build-out if development occurs in a fragmented way across multiple fronts simultaneously. In comparison, if the development were sequenced only half of the infrastructure might be triggered at 33 per cent of build-out, as illustrated in the middle part of Figure 1.

In the context of limited infrastructure funding, the fragmented growth scenario is more likely to result in available funds being spread more thinly and communities waiting longer for required infrastructure. To address this inefficiency, it was proposed that a preferred sequence of development could be prepared to manage costs across all infrastructure agencies. Departures from that preferred sequence could be approved subject to a developer paying for any increased costs to the agencies of a change to that sequence. (Spiller and Forrest 2017)

The concept of growth occurring simultaneously across multiple development fronts and the consequent earlier triggering of infrastructure requirements can be extended to higher density infill and redevelopment in existing urban areas, subject to the following differences:

- the more incremental nature of infill and redevelopment means infrastructure shortfalls will tend to only become apparent over the medium-long term, and
- the triggering of upgrades to existing infrastructure, as opposed to triggering new infrastructure, depends on the additional capacity that may be accommodated by that existing infrastructure.

The latter raises the other key issue for broad-scale upzonings for higher density infill and redevelopment, i.e. that infrastructure upgrading costs of infill development can vary widely by location. For example, investigations across the Sydney metropolitan area found variations of up to $75,000 per dwelling (NSW Productivity Commission 2023).

A number of studies have noted the desirability of prioritising or sequencing growth in housing development in those locations that have additional infrastructure capacity

(Hamilton and Kellett 2017; Infrastructure Australia 2018; NSW Productivity Commission 2023). However, what if zoning changes are broad-scale and do not differentiate areas based on infrastructure costs and availability? As most housing development is led by market forces, prioritisation is not possible, and comparison to a preferred sequence, as proposed above for greenfield growth, is less practical for what is generally smaller scale, incremental infill and redevelopment (Infrastructure Australia 2018).

The following sections consider how these matters have been addressed by the upzonings implemented and proposed in Auckland and Sydney.

The Auckland upzoning example

The Auckland Unitary Plan Operative in part (AUPOIP), that became effective in November 2016, provided for a substantial increase in dwelling capacity compared to the previous planning regime (see 'The Auckland upzoning impact: Dwelling type and tax matters' at: https://www.landsupplyinsight.com.au/insights). The proposed Plan Change 78 (PC78) notified in August 2022 provides for a substantial further increase in dwelling capacity to give effect to New Zealand's Medium Density Residential Standards (MDRS) and the National Policy Statement on Urban Development 2020 (NPS-UD), as amended in 2022.[1]

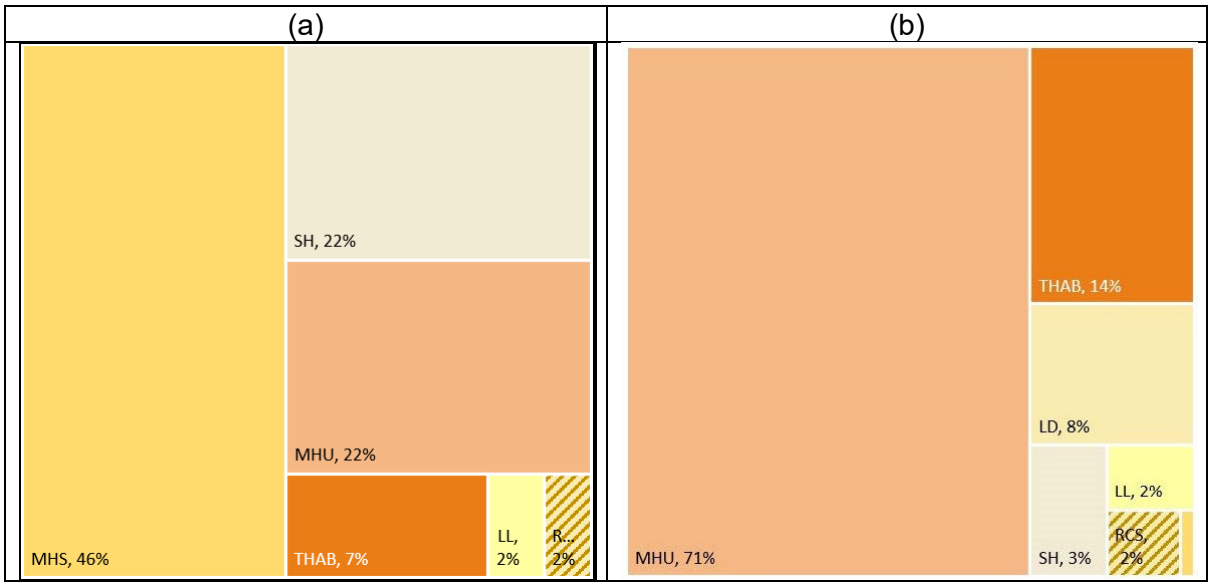
Figure 2 illustrates the percentage of sites by residential zone under the current AUPOIP and the proposed PC78 (from Balderstone *et al.* 2023). The zones identified and their standard development provisions under the PC78 (more variations apply, but are not important for this analysis) include:

- MHS – Mixed Housing Suburban – maximum two storeys, three dwellings per site permitted
- MHU – Mixed Housing Urban – maximum three storeys, three dwellings per site permitted
- THAB – Terrace Housing and Apartment Buildings – maximum six storeys (in walkable catchments[1]), no limit to dwellings per site (discretionary)
- SH – Single House – one new dwelling per site permitted (conversion of a dwelling, existing at 30 September 2013, to two dwellings also permitted)
- LL – Large Lot – one dwelling per site permitted
- RCS – Rural and Coastal Settlement – one dwelling per site permitted
- LD – Low Density – one dwelling per site permitted (conversion of a dwelling, existing at 30 September 2013, to two dwellings also permitted) (replaces SH where qualifying matters (QM) make higher density under the MDRS inappropriate).

(Balderstone *et al.* 2023; Greenaway-McGrevy 2023; Auckland Council 2022a, 2022e)

[1] The MDRS seeks to allow for up to three dwellings up to three storeys high on all residentially zoned land within the urban environment, unless qualifying matters (QM) apply, e.g. heritage or infrastructure constraints. The NPS-UD seeks to enable more development in the city centre and at least six-storey buildings within walkable catchments from the edge of the City Centre, Metropolitan Centres and Rapid Transit Stops, and to enable development in and around neighbourhood, local and town centres, again unless QM apply. (Auckland Council 2022a; Balderstone *et al.* 2023)

Figure 2: Per cent of sites by existing AUPOIP (a) and proposed PC78 (b) zone



The biggest proposed changes under PC78 are to the MHU zone to align with the MDRS and to the THAB zone to align with the amended NPS-UD.

Table 1 compares the net additional dwelling capacity in Auckland under the respective previous, current and proposed planning regimes (items 1, 2, 3 and 4) to the relevant projections of dwelling demand (Item 5). Those are also compared to a worst-case, minimum scenario for dwelling growth that can be accommodated by planned water supply, sewerage and transport networks (Item 6). (Balderstone *et al.* 2023; Fredrickson and Balderstone 2013)

Table 1: Dwelling capacity under respective planning regimes and planned infrastructure networks compared to projected dwelling demand, Auckland region[2]

Item	Measure of net dwelling capacity/demand	Number of dwellings
1	Pre-AUPOIP planning regime (as at May 2012)	241,246
2	AUPOIP (as at March 2022)	945,561
3	Proposed PC 78 (as at March 2022)	2,108, 280
4	Proposed PC 78 dwelling capacity located in areas which are infrastructure-ready in the long term (by 2052)	1,833,000
5	Projected additional dwelling demand 2022-2052 (Medium scenario)	197,120
6	Minimum (worst-case) scenario for dwellings accommodated by planned long-term water supply, sewerage and transport networks	153,200

The more than ten-fold difference between items 4 and 6, which both purportedly measure dwellings accommodated by planned infrastructure, arises from the fact that actual

[2] The AUPOIP and proposed PC 78 dwelling capacity figures are for residential zones only, excluding business and future urban zones. The pre-AUP figures exclude business areas and centres, but include some 'pipeline capacity' and rural areas.

infrastructure planning is based on an earlier set of BAU (Business as Usual, also referred to as 'i11v6') projections rather than the planned dwelling capacity. The difference between the two measures is:

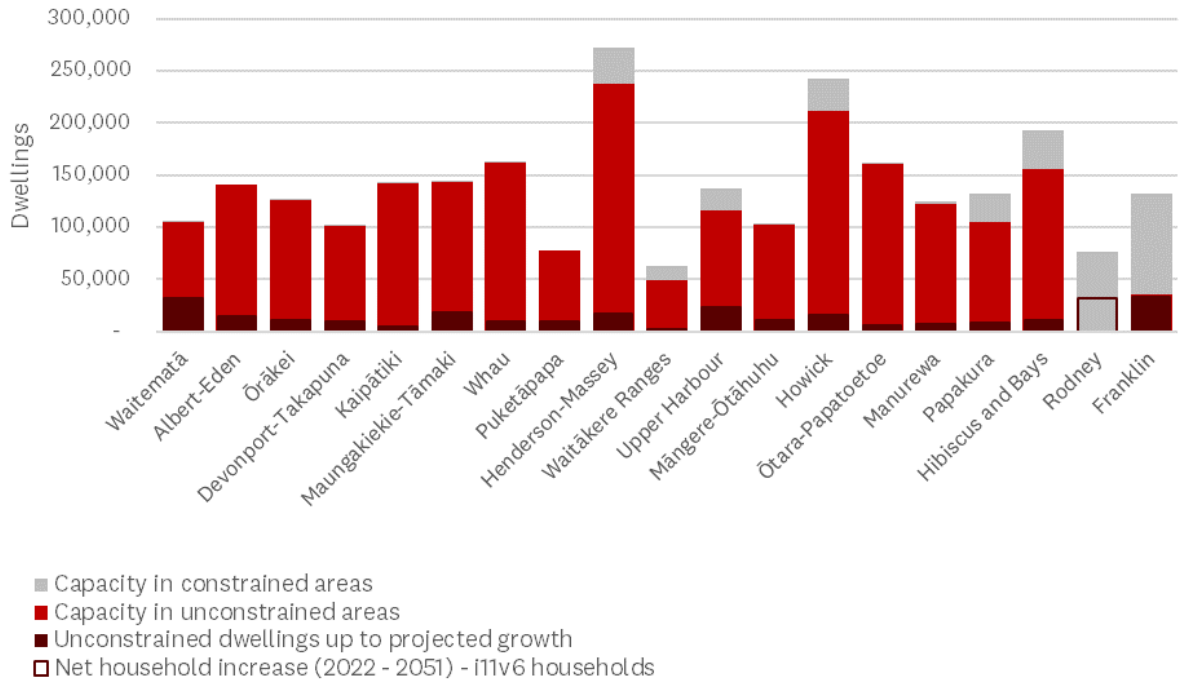
- the 'infrastructure-ready' measure in Item 4 includes all of the planned dwelling capacity located in areas where the planned long-term infrastructure accommodates the BAU projections. This figure is reported because the supporting analyses did not enable identification of the actual dwelling capacity supported by planned infrastructure, only that such infrastructure would as a minimum support the BAU projections in those areas;
- the minimum (worst-case) scenario in Item 6 is based on the actual net growth of the BAU projections located in areas where the planned long-term infrastructure can accommodate those projections. (Balderstone *et al.* 2023)

The actual dwelling capacity supported by planned long-term infrastructure is not able to be determined accurately from the supporting analyses, but is likely to exceed Item 6 and be far below Item 4. Elements of dwelling capacity not captured by item 6, because their quantum is unknown, include:

- the dwelling capacity able to be accommodated in those areas where planned infrastructure cannot accommodate the whole of the BAU projection of growth, but would accommodate some growth; and
- the dwelling capacity in excess of the BAU projections that the planned infrastructure could accommodate.

Despite the uncertainty in detail about planned infrastructure capacity, it is clear that the overall dwelling capacity planned far exceeds the projected dwelling demand over the 30-year horizon and also far exceeds what the planned infrastructure can accommodate. Figure 3 further illustrates the difference between the dwelling capacity provided for by the proposed PC78 and the projected growth, which is planned to be serviced in the long term, by local board area within Auckland (as shown, 'from left to right', correlates roughly with 'from the city centre outward') (Balderstone *et al.* 2023).

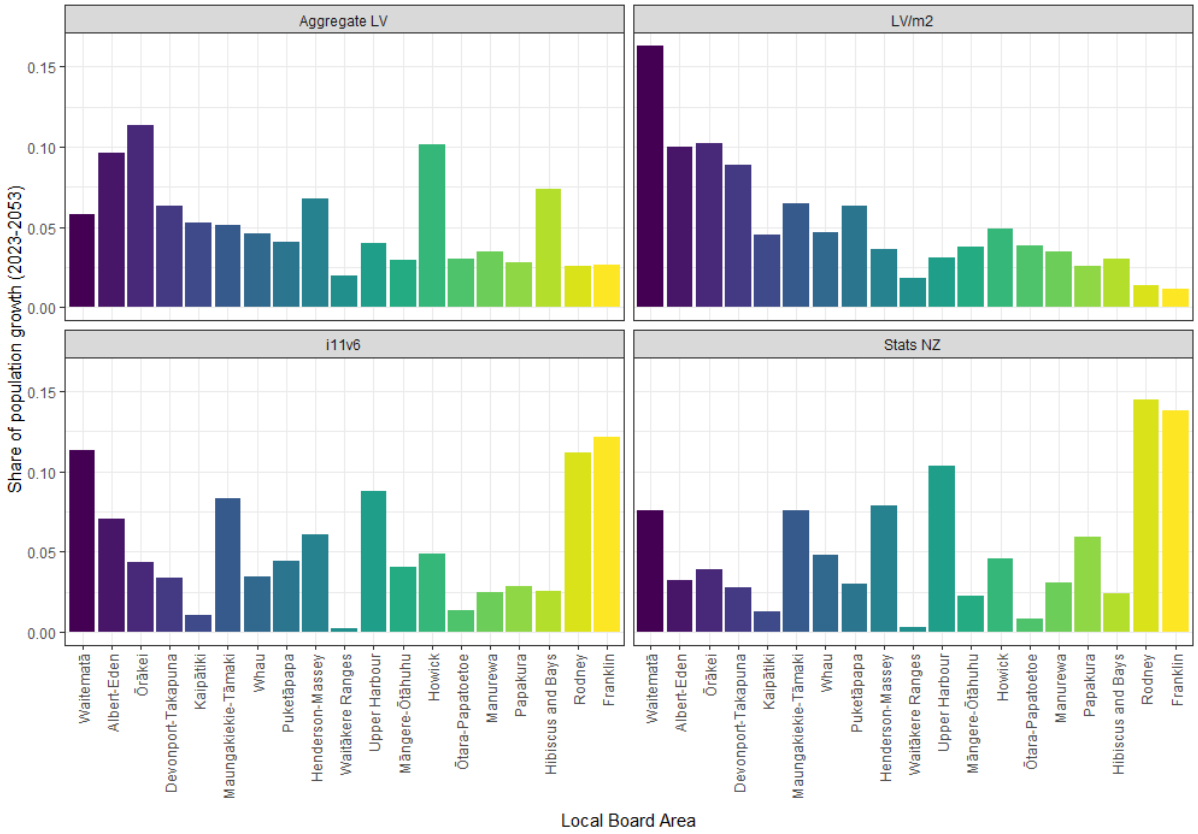
Figure 3: Dwelling capacity located in areas which are unconstrained by trunk water supply, wastewater and transport (up to projected growth), by local board area in Auckland



The planned dwelling capacity could also enable significantly different distributions of growth to that for which the infrastructure has been planned and such distributions could trigger upgrades across multiple catchments simultaneously. Reporting for Auckland Council noted the fact that three dwellings on a lot are permitted without consent throughout most of the urban residential area may result in a more dispersed and 'opportunistic' development pattern (M.E Consulting 2023).

Figure 4 illustrates the scope for variation in the distribution of dwelling growth, comparing distributions informed by land values (LV), both aggregate and per m^2 for the residential area, to the existing BAU ('i11v6') projections used for infrastructure planning and Stats NZ-based projections (Balderstone *et al.* 2023).

Figure 4: Share of population growth by Auckland Local Board Area (under different growth scenarios 2023-2053)



The graphs again show the 19 local board areas ordered ‘from left to right’, which correlates roughly to ‘from the city centre outward’. The biggest difference apparent is the much greater allocation of the existing BAU and Stats-NZ projections to greenfield growth in the Rodney and Franklin local board areas.

The proposed PC78 has directly recognised limited existing infrastructure constraints on development by including QM in relation to water and wastewater servicing, stormwater disposal and transport in some areas. For example:

- the water and wastewater QM identifies about 51,000 sites where higher density development is subject to limitations in the provision of those services in the next 10 plus years; and
- the transport QM identifies about 2,400 sites in the Beachlands peninsula community which has only one external road connection with limited capacity to accommodate additional traffic.

The effect of the proposed QM is to enable Council to refuse any applications for more than one dwelling on a site within mapped QM areas, where the effects on the respective infrastructure networks cannot be appropriately managed. (Auckland Council 2022a, 2022b, 2022c, 2022d)

It is noted the MDRS provisions, which also apply to other large urban areas in New Zealand, effectively allow most urban residential zoned sites to have three dwellings developed without consent (New Zealand Government 2022). Given that, some New Zealand councils have been concerned about the funding and coordination of infrastructure

to service future growth (Helm 2024; LG Magazine 2021). Auckland Council has noted the following in relation to the proposed PC78:

> *… the planning system provides more choice and is therefore less useful at giving direction on where and when development is likely to occur. We expect this reduction in the utility of land use planning for predicting development patterns to result in infrastructure spending being directed towards areas with existing high demand and greater likelihood of take-up.* (Balderstone *et al.* 2023, p.ii)

To the extent the greater flexibility of the planning system provides for significant shifts in infill development patterns over time, this likely leads to more uncertainty and less efficiency in infrastructure planning, funding and provision.

The Sydney upzoning example

The New South Wales (NSW) state government is part way through implementation of '…the biggest planning reforms this state has ever seen.' (NSW DPHI 2024a). While to some extent applying across the state, the major area of impact of those reforms is Sydney, together with the adjacent Illawarra, Hunter and Central Coast regions. The key elements of those reforms include:

- the Transport Oriented Development (TOD) Program, which includes:
    - Accelerated Precincts, which:
        - are state-led rezonings within 1,200 metres of eight priority high growth areas near transport hubs in Greater Sydney,
        - includes seven rezonings advertised in July-August 2024 and the other expected in 2025, and
        - are expected to create capacity for up to about 62,000 homes over 15 years; and
    - Tier 2, which:
        - applies to land within 400 metres of 37 transport hubs and town centres,
        - are being progressively 'switched on' from May 2024 to June 2025 through an amended State Environmental Planning Policy (SEPP), subject to the implementation of suitable alternative/equivalent local planning controls,
        - provides for residential flat buildings up to 6 storeys in all residential and local centre zones within the designated areas, and
        - is estimated to deliver more than 170,000 new homes over the next 15 years.

  (NSW DPHI 2024a, 2024b; NSW Government 2023, 2024a, 2024b, 2024c)
- the 'Low and mid-rise housing changes', which are expected to deliver 112,000 more homes over the next five years, including:

- Stage 1, which:
  - with some exceptions, permits (with consent[3]) dual occupancies and semi-detached homes in the R2 low-density residential zone across NSW[4] (the R2 zone covers about 77 per cent of residential areas across the Sydney, Illawarra, Hunter and Central Coast regions), and
  - commenced on 1 July 2024, through an amendment to the SEPP (Housing) 2021; and
- Stage 2, which:
  - is to be announced in detail later in 2024,
  - will apply to precincts within 800-metre walking distance from particular town centres and stations to be identified across Sydney and the Illawarra, Hunter and Central Coast regions,
  - will expand the permissibility of other low and mid-rise housing types, including terraces and townhouses in R1, R2 and R3 zones, low-rise apartment buildings in R1 and R2 zones, and mid-rise apartment buildings in R3 and R4 zones, and
  - will facilitate the above housing types through changes to development standards such as building heights and floor space ratios.

(NSW DPE 2023; NSW Government 2024d, 2024e)

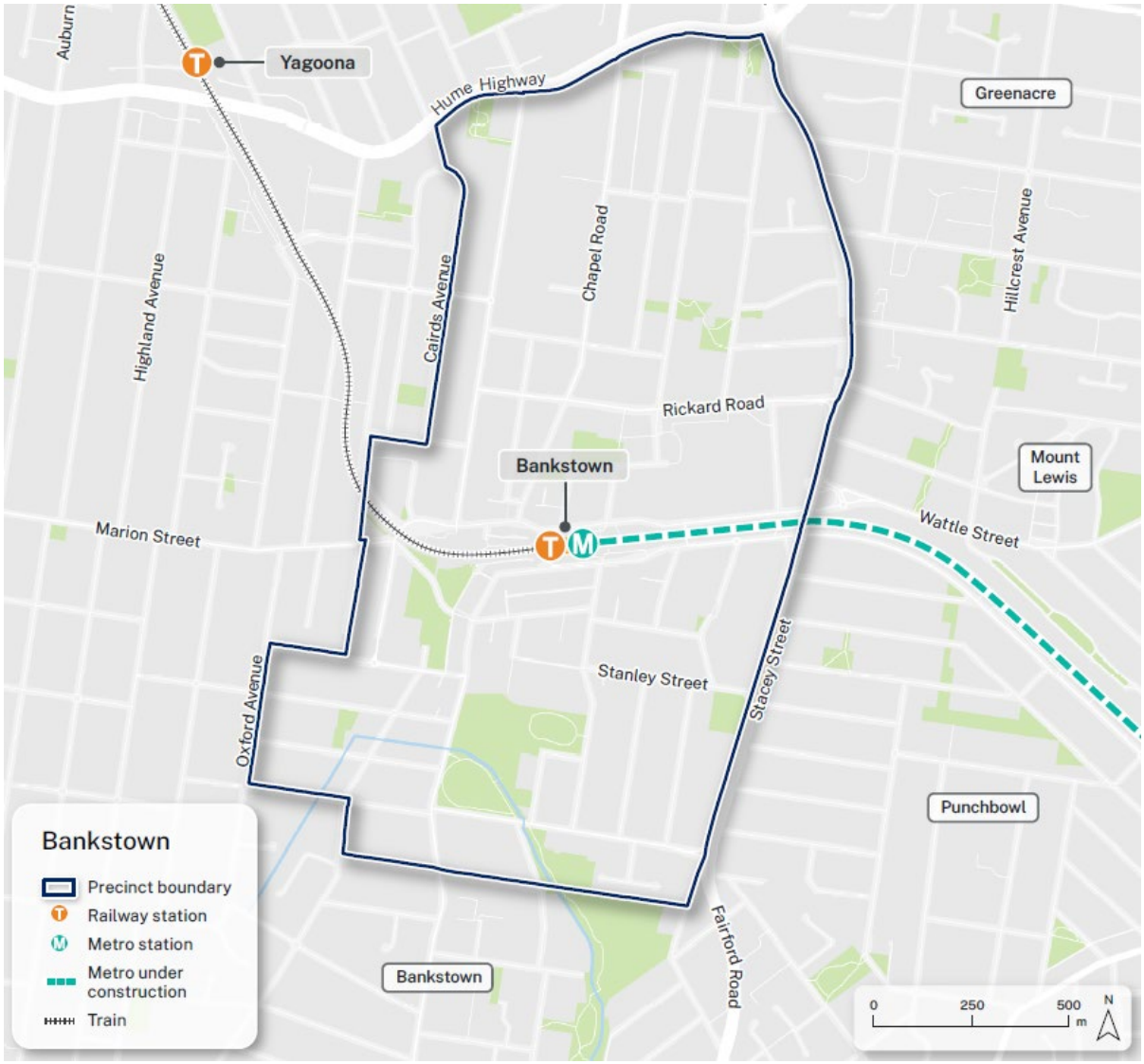
Figure 5 illustrates the Bankstown accelerated precinct as an example of the TOD Program (NSW Government 2024f).

[3] There are also certain state identified 'non-discretionary development standards' which mean that consent cannot be refused, on that basis, if those standards are met (NSW Government 2024e).

[4] In summary, the NSW urban residential zones are as follows:

- R1 – General Residential – provides a wide variety of residential densities and housing types;
- R2 – Low Density Residential - the lowest density urban residential zone and the most restrictive in terms of other permitted uses. It typically features detached houses, but it may be appropriate to include dual occupancy or some multi-dwelling housing;
- R3 – Medium Density Residential – is for a variety of medium-density accommodation; and
- R4 – High Density Residential – is generally intended for primarily high-density housing, such as residential flat buildings. (Realtisan 2024)

Figure 5: Bankstown TOD precinct



Supporting material indicates the following in relation to infrastructure availability to support the TOD program:

- the Accelerated Precincts:
    - were informed by the analysis of 305 Sydney Train, Sydney Metro and Intercity stations to identify locations that have enabling infrastructure capacity, including investigation of roads and water and sewerage capacity, and
    - are supported by $520 million committed by the NSW government for community infrastructure such as road upgrades, active transport links and public open spaces;
- the 37 Tier 2 precincts:
    - were also informed by the above analysis of 305 stations to identify locations that have enabling infrastructure capacity close to a transport station, and
    - in preparing suitable alternative/equivalent local planning controls for the identified precincts, Councils are advised further studies of infrastructure

capacity are not required as such issues were addressed in the identification of the precincts.

(NSW DPHI 2024b; NSW Government 2023)

For the 'Low and mid-rise housing' planning changes, the following are noted in relation to supporting infrastructure cost and availability:

- Sydney Water (which supplies reticulated water and sewerage services to Greater Sydney and the Illawarra) and Transport for NSW (which leads the development of an integrated transport system for NSW) were engaged through the development of the policy,
- concerns about traffic and congestion and the need for accompanying infrastructure were among the most common issues raised as part of consultation on the changes,
- infrastructure to support new housing in existing urban areas was identified as more cost-effective, efficient and lower cost, without differentiating between areas, even though there may be significant existing capacity and cost differences between areas (NSW Productivity Commission 2023). However, the fact that the Stage 2 changes will apply to 'particular', rather than all, town centres and stations may provide for relative infrastructure costs and availability to influence the locations chosen,
- to ensure Councils have sufficient revenue to fund any new or upgraded local infrastructure required, some changes may be required to current infrastructure contributions frameworks,
- any new dwellings created are subject to the Housing and Productivity Contribution (previously the State Infrastructure Contribution), which will go towards state and regional infrastructure such as roads, parks, hospitals and schools.

(NSW DPE 2023; NSW Government 2024d).

Discussion, conclusions and implications

At their lowest density, both the Auckland and Sydney planning changes apply to extensive areas, i.e. over 70 per cent of their urban areas provide for three dwellings and two dwellings, respectively, to replace an existing house. Auckland is the most permissive, in that two dwellings are permitted without consent across nearly all of the urban area, and three dwellings permitted without consent across over 70 per cent of the city. In Sydney consent is still required for two dwellings, although compliance with identified 'non-discretionary development standards' means consent cannot be refused, at least not on that basis.

Given the costs of land acquisition and replacing an existing dwelling, the proportion of sites likely to be feasible for redevelopment into two or three dwellings, respectively, over time is likely to be lower in Sydney than Auckland. The areas where higher densities are planned around centres and stations are also more selective in Sydney. The infrastructure cost and availability issues resulting from a more dispersed and less predictable development pattern are therefore likely to be more significant in Auckland.

Some concerns have been raised about infrastructure implications in both jurisdictions. One difficulty is the potential for the pattern of development to vary significantly from that which has informed infrastructure planning and funding requirements to date. Also, to a greater extent than previously only the passage of time and the actual rate of development in different areas will inform future infrastructure upgrade requirements and planning. Given the incremental nature of infill development, it may be some years before significant issues

emerge, but in the interim and ongoing there will be more uncertainty for infrastructure planning and funding decision-making. This will particularly be the case in Auckland which has provided more significant development potential across the urban area with only limited exclusion of areas due to existing infrastructure constraints.

In general, while it could be useful for managing greenfield growth, the incremental nature of infill development makes the identification of a preferred sequence of development a less practical tool for managing the costs and availability of upgraded infrastructure. By their very nature, broad-scale upzonings tend to remove zoning itself as a tool for such management, leading to greater uncertainty and the potential for greater costs or delays in the provision of necessary infrastructure upgrades.

The key consideration for decision-making in this regard is whether the expected/intended benefits of broad-scale upzoning, i.e. primarily increased housing supply, warrant the community costs of poorer management of the costs and availability of upgraded infrastructure. To the extent the housing supply benefits are not real or significantly overstated, there is less justification for broad-scale upzonings.

The concept of equilibrium market absorption rates suggests the rate at which developers can feasibly supply a market over time is the key determinant of the rate of new private market housing supply, not the planning system (Murray 2024). It is hypothesised that such absorption rates apply unless the planning system itself creates binding constraints on supply, e.g. as the pre-AUP planning regime may have done for the supply of townhouses in Auckland (see 'The Auckland upzoning impact: Dwelling type and tax matters' at: https://www.landsupplyinsight.com.au/insights).

The breadth and scale of upzonings now proposed in Auckland appear far in excess of what is likely to be required to avoid placing binding constraints on the operation of the market. The changes made and proposed in Sydney, while substantial, are more moderate and selective than in Auckland and consequently should provide for better management of the costs and availability of infrastructure.

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